

Intertidal Explorations

Teacher Packet

Program: A third through fifth grade program about the variety of life in the rocky intertidal zones.

Capacity: Thirty-five students. One adult per five students required.

Time: One hour block. Tidal dependent.

Meeting Locations: Meet at the volunteer trailer in the first tidepool parking lot.

Park Theme to be Interpreted: The splash, high, middle and low tide zones within the rocky intertidal areas are home to a multitude of life. Plants, animals and other organisms that live in the intertidal zones must have special adaptations to survive in this ever-changing habitat.

Guiding Question: How have the intertidal animals adapted to meet the needs within their specific zones?

Learning Outcomes: At the completion of this program, students will be able to:

1. Describe two characteristics of the tidepool ecosystem.
2. Describe an intertidal animal and its adaptations.
3. Choose a tidepool species and compare the population at two different sites making inferences about the tolerance of that species for air and water.

NGSS Standards Addressed:

Grade 3:

- 3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Grade 4:

- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Grade 5:

- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

THE PROGRAM

Vehicle transportation is necessary to reach the tidepool area, as there is no sidewalk between the upper are of the monument and the tidepool area. **If you plan to visit the lighthouse, visitor center, or see a movie in the auditorium, you must have transportation available for the duration of your visit.**

Please arrive at least 10 minutes before the ranger program so that you will be ready to start on time. From the parking lot, the ranger will walk the class down the trail a short distance where they will spend about 15 minutes talking about intertidal animals and their habitat.

Students will work in small groups to study two areas in the tidepools. They will identify the creatures in their plots and discuss the creatures' adaptations, similarities and differences. If parents are available for each group that is fine, but since the students will be conducting the learning experience themselves, one adult can supervise two groups. **The goal of the field experience is to allow the students to become familiar with this extraordinary region and its life by using the observation and recording techniques of scientists.**

SAFTEY

Make sure the students are dressed warmly and are wearing **sturdy shoes with good rubber soles**. The rocks are slippery! You may want to bring **sunscreen, sunglasses and a hat** as well.

TIDEPPOOL FACTS!

- The tides cover and expose the rocks and beaches every day.
- **Rocks** provide a hospitable environment in which many animals and plants make their homes. They may live on or under rocks, or they may live in a pool formed by the rocks.
- In exposed areas, the animals have to withstand the **force of waves**, as well as **desiccation** (drying out) during low tides.
- Pool areas may not receive water for many days and consequently dry up or become very salty as the water evaporates.
- At **low tide**, organisms will be left exposed, high and dry, until the next high tide. As waste products accumulate, the area becomes increasingly hostile, yet creatures persist.
- An intertidal animal or plant has special characteristics to live successfully in this environment. These survival techniques are called **adaptations**.
- **Three zones** can be seen in the tidepool area. The distinguishing organisms are distributed based on their ability to tolerate exposure to air.
 - In the **high intertidal zone** the animals that are closer to the cliffs receive a tidal flushing only during the highest of the tides, perhaps only twice a month during the full and new moon period.
 - In the **middle intertidal zone** the animals will be inundated roughly twice a day.
 - In the **low intertidal zone** area, the creatures are underwater the majority of the time.

SOURCES FOR MORE INFORMATION

Birch Aquarium at Scripps website: <http://aquarium.ucsd.edu/>

Diving Into Oceans. Ranger Rick's Nature Scope, National Wildlife Federation – Lesson Ideas

Life at the Edge Of the Sea. Malnig, Anita – Science trade book for children.